INSTRUCTION MANUAL

WIRELESS GATEWAY
(Modbus-RTU Transparent 920MHz Band Wireless Device (Child device) for Taiwan)

MODEL **WL40MW1TW**

BEFORE USE ....

Thank you for choosing us. Before use, please check contents of the package you received as outlined below.
If you have any problems or questions with the product, please contact our sales office or representatives.

■ PACKAGE INCLUDES:

Wireless gateway.....(1)
Antenna .....(1)
Terminating resistor (110 Ω, 0.25 W).....(1)
Ferrite core (TDK ZCAT 3035-1330).....(1)

■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

■ INSTRUCTION MANUAL

This manual describes necessary points of caution when you use this product, including installation, connection and basic maintenance procedures.
For information on the introduction of wireless device, refer to the 920MHz band wireless device users manual (EM-9120).

POINTS OF CAUTION

■ POWER INPUT RATING & OPERATIONAL RANGE

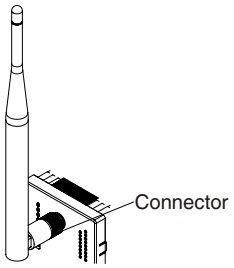
- Locate the power input rating marked on the product and confirm its operational range as indicated below:
  24V DC rating: 24V ±10%, ≤ 70mA
  12V DC rating: 12V ±10%, ≤ 130mA

■ GENERAL PRECAUTIONS

- Before you remove the unit or mount it, turn off the power supply for safety.

■ ENVIRONMENT

- Indoor use.
- When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient ventilation.
- Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- Environmental temperature must be within -20 to +60°C (-4 to 140°F) with relative humidity within 10 to 90% RH in order to ensure adequate life span and operation.
- Attach the antenna to the unit.
- Attachment and adjustment of sleeve antenna; Loosen the connector (See the top-right figure.), and rotate the antenna. Holding the antenna vertical, tighten the connector by hand. Make sure to fix the antenna firmly.



- Attachment of rooftop antenna; There is a magnet on the bottom face which allows you to attach the antenna on a metal box and such. To obtain optimum performance from the antenna, attach on a metal plate (recommended dimension: 500 mm × 500 mm or more). However, in the case of connecting FE1 to a metal plate, the isolation between FE1 and antenna connector will be lost. Tighten the connector with a specified torque (0.9 N·m). As a guide, finger-tighten it until the connector stops, and then rotate it 10 to 15 degrees with a wrench. Do not force the cable to bend less than acceptable radius of 3 cm.
- Using 7.5 m coaxial cable (model: CX-SAC0SAD0Q0750) (OKI) for extension decreases transmission distance.
- When installing the rooftop antenna outdoor, perform regular maintenance and inspections because of the risk of corrosion depending on the environment.

■ WIRING

- Do not install cables close to noise sources (relay drive cable, high frequency line, etc.).
- Do not bind these cables together with those in which noises are present. Do not install them in the same duct.

■ ATTACHING FERRITE CORE

- Attach the ferrite core included in the package at the unit side of power cable.

■ AND ....

- The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

CAUTION REGARDING RADIO FREQUENCY

- For use in Taiwan only.
- When using a device incorporating this product, obtaining certification may be necessary due to NCC regulations.

■ NCC CAUTION

取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。低功率射頻器材之使用不得影響飛航安全及干擾合法通信； 經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前述合法通信，指依電信管理法規定作業之無線電通信。低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

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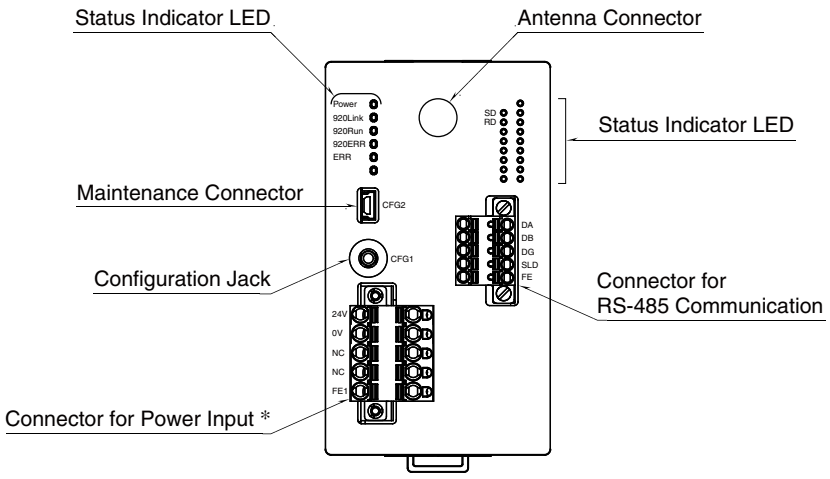
COMPONENT IDENTIFICATION

■ FRONT VIEW



* Power input defers depending on the power input code you select.

■ STATUS INDICATOR LED

ID	STATUS	COLOR	FUNCTION
Power	ON	Green	Power is on.
920Link	ON	Green	Wireless: coordinator is connected
	0.5 Hz blinking	Green	Wireless: coordinator connection in process
	Blinking twice per second	Green	Wireless: start-up error
920Run	ON	Green	Wireless: normal communication
920ERR	ON	Red	No detour
	Blinking	Red	Network authentication failure
ERR	ON	Red	Modbus communication error

■ STATUS INDICATOR LED

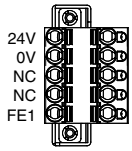
ID	STATUS	COLOR	FUNCTION
SD	ON	Green	RS-485 transmission
RD	ON	Green	RS-485 reception

■ TERMINAL ASSIGNMENTS

• Connectors for power input

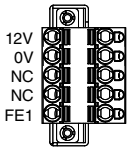
Unit side connector: MSTBV2,5/5-GF-5,08AU (Phoenix Contact)
Cable side connector: TFKC2,5/5-STF-5,08AU (Phoenix Contact)

Power input code: R (24 V DC)



ID	FUNCTION
24V	Power input 24 V
0V	Power input 0 V
NC	Not used
NC	Not used
FE1	Power input earth

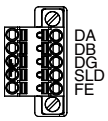
Power input code: S (12 V DC)



ID	FUNCTION
12V	Power input 12 V
0V	Power input 0 V
NC	Not used
NC	Not used
FE1	Power input earth

• Connector for RS-485 communication

Unit side connector: MC1,5/5-GF-3,5 (Phoenix Contact)
Cable side connector: TFMC1,5/5-STF-3,5 (Phoenix Contact)



ID	FUNCTION
DA	DA
DB	DB
DG	DG
SLD	Shield
FE	Functional earth

CONFIGURATOR SOFTWARE SETTING

With configurator software, settings shown below are available.
Refer to the users manual of W920FCFG for detailed operation.

■ WIRELESS SETTING

ITEM	SETTING RANGE	DEFAULT
Preferred PAN ID (group number)	0000 – FFFE (hexadecimal, 4 digits)	0000
Radio channel number	1 – 8 (selectable up to 8 channels)	None
Short address	0000 – FFFD (hexadecimal, 4 digits)	0000
Network name	English one-byte characters within 16 characters (one-byte space, “-”, “_”, “.”, “@” are usable.)	Blank
Encryption key	0000...0 – FFFF...F (hexadecimal, 32 digits)	0000...0
Transmitter power output	0.16mW / 1mW / 20mW	20mW
Low-speed moving mode	No / Yes	No
Device type in a network, Number of devices in a network	Child (fixed), 1 to 30 devices / Child (fixed), 31 to 60 devices / Child (fixed), 61 to 100 devices / Child (fixed) + child (moving)	Child (fixed), 1 to 30 devices
Set network quality	Standard (recommended) / Frequency of route switching and delay (higher) / Frequency of route switching and delay (highest)	Standard (recommended)
Network join mode	V3-compatible mode / Fast join mode	V3-compatible mode
Fixed route	No / Yes	No
Destination short address	0000 – FFFD (hexadecimal, 4 digits)	0000
Temporary detour	No / Yes	Yes
Packet filtering	None / Yes (polling type)	Yes (polling type)
Filter timeout on polling	1.0 – 60.0 (sec.)	1.0 (sec.)
920Run timeout	1.0 – 60.0 (sec.)	3.0 (sec.)
Retry times before route switching	Once / Twice / Three times	Three times

■ MODBUS SETTING

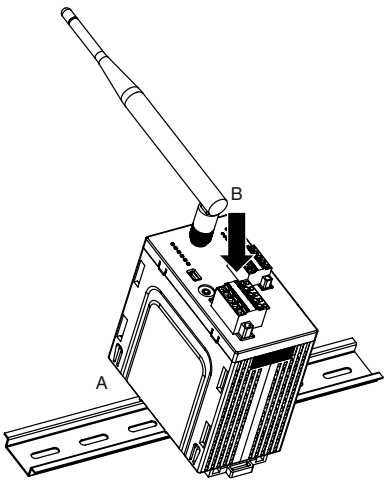
ITEM	SETTING RANGE	DEFAULT
Transfer rate	38400 / 19200 / 9600 / 4800 bps	38400 bps
Parity bit	Odd / Even / None	Odd
Stop bit	1 bit / 2 bits	1 bit

INSTALLATION

■ DIN RAIL MOUNTING (PARALLEL)

A) Hook the upper hook at the rear side of the base onto the DIN rail.

B) Push the lower part of the unit in the direction of the arrow until the base is firmly fixed to the DIN rail.

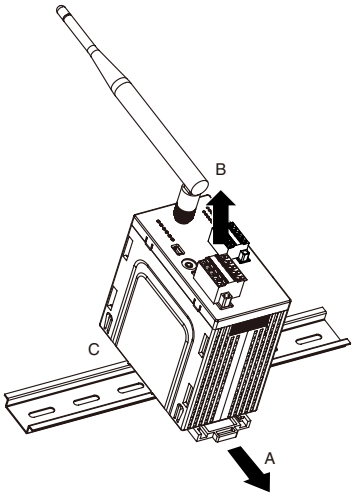


■ DEMOUNTING

A) Push down the slider using a minus screwdriver.

B) Pull out the lower part of the unit.

C) Remove the upper part of the unit from the DIN rail.

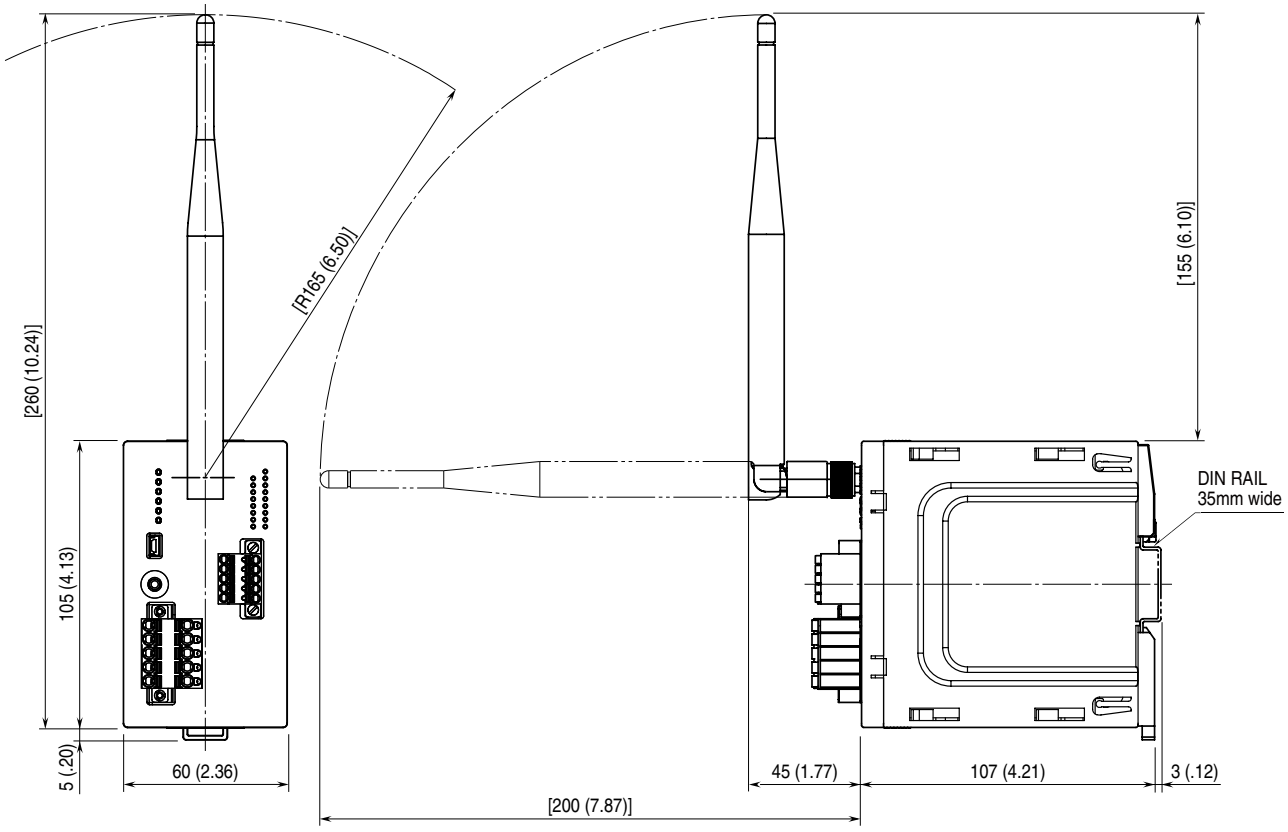


TERMINAL CONNECTIONS

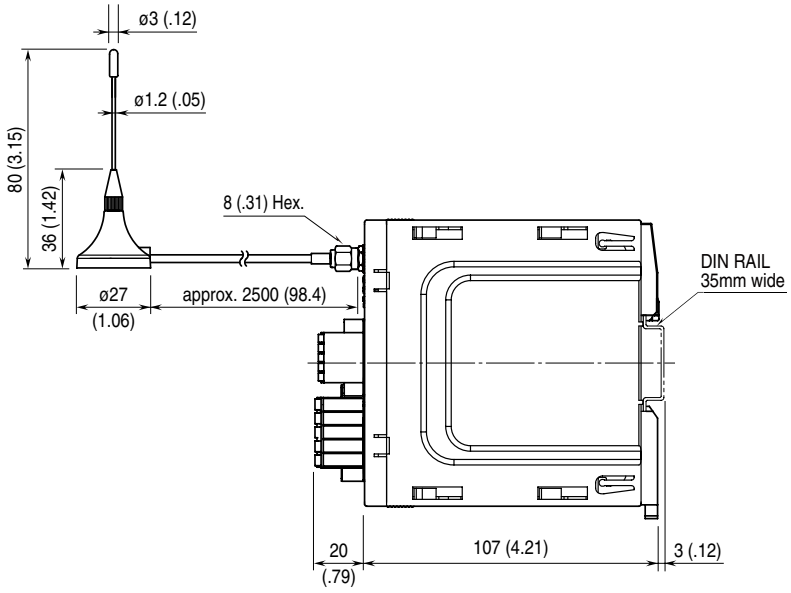
Connect the unit as in the diagram below.

■ EXTERNAL DIMENSIONS unit: mm (inch)

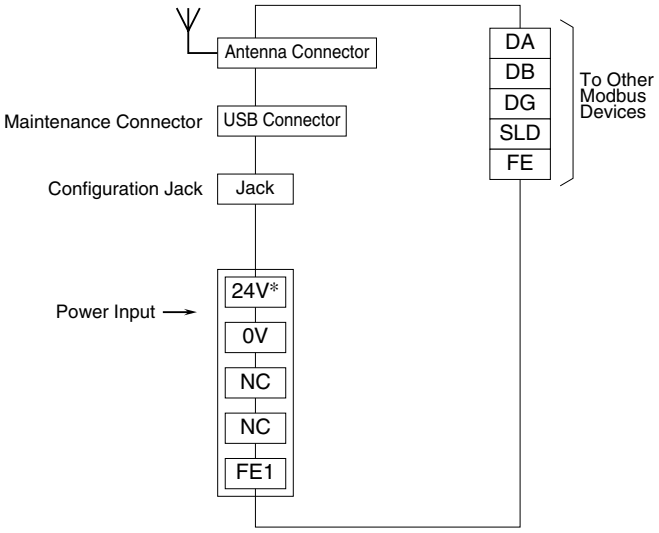
• With sleeve antenna



• With rooftop antenna



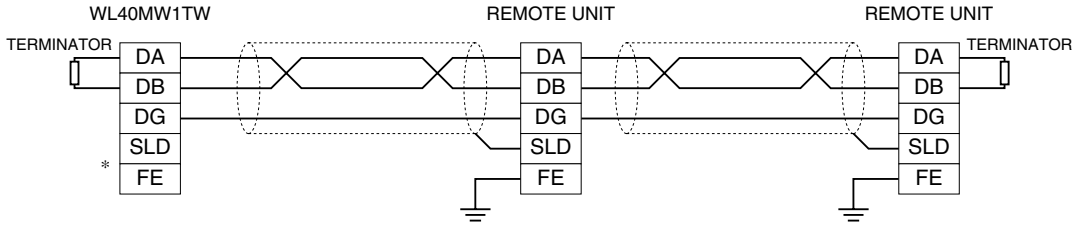
■ CONNECTION DIAGRAM



* Power input defers depending on the power input code you select.

WIRING INSTRUCTIONS

■ WIRING CONNECTION WITH SLAVE DEVICES



* Connect SLD and FE for reducing noise interference if necessary.

Note: Be sure to connect the terminating resistor included in the product package to the unit at both ends of communication line.
The terminator must be connected across “DA” and “DB”.

■ TENSION CLAMP (FRONT TWIN CONNECTION) FOR POWER INPUT

Applicable wire size: 0.2 to 2.5 mm^2
Stripped length: 10 mm
Recommended terminals:
AI0,25-10YE 0.25 mm^2 (Phoenix Contact)
AI0,34-10TQ 0.34 mm^2 (Phoenix Contact)
AI0,5-10WH 0.5 mm^2 (Phoenix Contact)
AI0,75-10GY 0.75 mm^2 (Phoenix Contact)
AI1-10RD 1.0 mm^2 (Phoenix Contact)
AI1,5-10BK 1.5 mm^2 (Phoenix Contact)
AI2,5-10BU 2.5 mm^2 (Phoenix Contact)

■ TENSION CLAMP (FRONT TWIN CONNECTION) FOR COMMUNICATION

Applicable wire size: 0.2 to 1.5 mm^2
Stripped length: 10 mm
Recommended terminals:
AI0,25-10YE 0.25 mm^2 (Phoenix Contact)
AI0,34-10TQ 0.34 mm^2 (Phoenix Contact)
AI0,5-10WH 0.5 mm^2 (Phoenix Contact)
AI0,75-10GY 0.75 mm^2 (Phoenix Contact)

MODBUS FUNCTION CODE

Modbus function codes are shown below.

■ DATA AND CONTROL FUNCTION

CODE	NAME	
01	Read Coil Status	Digital output from the slave (read/write)
02	Read Input Status	Status of digital inputs to the slave (read only)
03	Read Holding Registers	General purpose register within the slave (read/write)
04	Read Input Registers	Collected data from the field by the slave (read only)
05	Force Single Coil	Digital output from the slave (read/write)
06	Preset Single Register	General purpose register within the slave (read/write)
08	Diagnostics	
15	Force Multiple Coils	Digital output from the slave (read/write)
16	Preset Multiple Registers	General purpose register within the slave (read/write)

■ EXCEPTION CODE

CODE	NAME	
01	Illegal Function	Function code is not allowable for the slave
02	Illegal Data Address	Address is not available within the slave
03	Illegal Data Value	Data is not valid for the function
04	Slave Device Failure	
05	Acknowledge	
06	Slave Device Busy	
07	Negative Acknowledge	

LIGHTNING SURGE PROTECTION

We offer a series of lightning surge protector for protection against induced lightning surges. Please contact us to choose appropriate models.